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ANALYSES OF SOME INDIGENOUS DRUGS.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy, No. 102.

Louis H. Koch examined two samples of *Taraxacum officinale*, one of the root as he found it in commerce, the other of the root collected by himself in March, at Leetonia, Ohio. The commercial sample yielded 15·60 per cent., and the other 5·20 per cent. of inulin. The former was also submitted to a proximate analysis, and, while no new principles were obtained, the following percentages of the compounds already known to exist in it, besides the inulin, may be of interest:

	Per Cent.
Moisture	7·95
Ash	22·50
Volatile matter at 110°	·02
Fat	·44
Wax	·09
Caoutchouc	·10
Resin soluble in ether	·35
Resin insoluble in ether	·22
Mucilage	8·49
Saccharose	1·08
Glucose	·46
Albuminoids	4·89

The taraxacin was separated by dissolving the alcoholic extract in water and agitating with chloroform. The amount was not determined.

William Pfeuffer submitted the over-ground portion of *Balmony* to a proximate analysis and detected the presence of a glucoside in

the ethereal and alcoholic extracts. The peculiar disagreeable odor evolved by the decomposition of this glucoside was noticed throughout the analysis.

There were also obtained the following percentages of the usual plant constituents:

	Per Cent.
Moisture	8·43
Ash	7·55
Wax melting at 45°	1·57
Resin soluble in ether	1·50
Mucilage	2·72
Dextrin	·96
Saccharose	8·00
Glucose	4·50
Albuminoids	·96
Calcium oxalate	2·76

Crystals giving the reactions of gallic acid were obtained from the ethereal extract, and the aqueous solution of the alcoholic extract gave a dark color with ferric chloride, but the presence of tannin could not be satisfactorily demonstrated by gelatin.

Charles A. Ridgway investigated *Glechoma hederacea*, which he collected himself. It is more widely-known by the names of Gill-go-over the ground, or cat-foot.

A native of Europe, it has become naturalized in the United States, where it grows around old buildings, fence corners and other neglected places. The plant remains green the year around, but the stalks are more erect and the leaves larger during the warm weather, especially during the flowering period from May to September.

The use of the plant is confined to domestic practice, where it is used in the form of a cold infusion made by beating some of it with sufficient cold water to cover, and straining by expression. This is given in tablespoonful doses, and is considered to be of service in allaying fever and nausea. Pectoral, anthelmintic, tonic and diuretic properties are also ascribed to the drug. No unusual plant constituents were found in the course of a proximate analysis. The following percentages were obtained:

	Per Cent.
Volatile oil	·06
Acrid fat melting at 53°	·96
Caoutchouc	·38
Wax	·66

	Per Cent.
Resin and chlorophyll	2·00
Resin soluble in alcohol	2·41
Glucose	2·49
Saccharose	·40
Mucilage	5·18
Tannin	2·64
Albuminoids	4·08
Moisture	6·16
Ash	15·90

In experiments on the manufacture of the fluid extract, the best results were obtained by a menstruum of two parts alcohol to one of water.

AN ANALYSIS OF TRILLIUM.

By Vivian I. Reid.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy. No. 101.

Read at the Pharmaceutical Meeting, January 19.

Trillium, or beth-root, birth-root and wake-robin, as it is called, is an herbaceous plant belonging to the natural order of liliaceæ, and is indigenous to the United States, being found in damp woods. The rhizome is the part of the plant employed medicinally, and is sub-globular, or obconical in shape, about 1½ inches long and from ½ to ¾ inch in thickness; it is annulate, of an orange-brown color and has numerous light-brown rootlets. Upon transverse section the rhizome presents a mealy appearance, with the fibro-vascular bundles arranged in a circle or wavy line near the circumference. When moistened with tincture of iodine, it turns to a dark-blue color. It is inodorous, the taste astringent and bitter.

Its medicinal properties are emmenagogue and emetic. The American aborigines used this plant, and it has been employed as a poultice for tumors and ulcers in domestic practice. Boiled with milk it is said to be beneficial in the treatment of diarrhœa and dysentery.

The first notice of its medicinal properties was published in Henry's Herbal, in 1812. In the year 1820, Dr. S. W. Williams published an interesting article relating to the value of the different species of trillium, in the New England Journal of Medicine and Surgery, and later, another in the New York Journal of Medicine, volume viii, page 94.

The drug was first examined by Professor E. S. Wayne, of Cincinnati, in the year 1856, who noticed its peculiar acrid taste which somewhat resembled that of senega. Upon analysis the acrid principle was found not to be precipitated by lead acetates. However, a white amorphous powder was obtained by pouring a concentrated tincture into water, filtering, removing pectinous substances and setting aside 24 hours when it gelatinized. It was next filtered and dried. This principle resembled saponin; had the property of frothing when a small quantity was shaken with water, and was called trillin. The result of this analysis was published in the American Journal of Pharmacy, volume xxviii, page 512.

In my investigation, a quantity of the drug was obtained from a reliable source and percolated with 95 per cent. alcohol until exhausted. The alcohol was removed by distillation and the concentrated tincture poured into acidulated water containing ½ per cent. of hydrochloric acid. After standing, it was filtered to remove the fat and oily resinous matter which had been precipitated. The filtrate was tested for tannic acid by use of ferric chloride, and the decoction for starch by use of iodine, their presence being determined. The remaining filtrate was shaken successively with petroleum ether, ether and chloroform. The petroleum ether extract consisted of resin which had not been precipitated by water.

The ether extract was dissolved in water; this solution shaken with ether, the ether decanted and allowed to evaporate. It was again dissolved in ether, and on evaporation left a crystalline residue, which was acid to litmus paper and gave no reaction with ferric chloride. A portion of this crystalline principle was dissolved in water, saturated with barium carbonate, filtered and set aside to evaporate. As a result, a crystalline residue was obtained which, upon being dissolved in water, gave tests for barium. It was also tested and found not to consist of a chloride. A second portion was treated with a drop of strong sulphuric acid, and gave a purplish-brown color which, on the addition of a crystal of potassium bichromate, turned to a light green color. A third portion was treated with strong nitric acid and dissolved, but gave no color.

Owing to the presence of a substance which tended to emulsify with the solvents, only a small quantity of the chloroform extract was obtained, and consisted of gummy principles. The solution was again shaken with petroleum ether to remove the remaining

chloroform, then made alkaline and shaken successively with petroleum ether, ether and chloroform, but on account of this substance forming an emulsion with all of the solvents, the nature of the substances removed by them could not be determined. On examination of the original precipitate, obtained by pouring the concentrated tincture into acidulated water, it was found to be slightly acrid. A portion was treated with ether and the ether after filtering allowed to evaporate. From the residue the same color tests were received as with the previous acid crystalline principle, thus showing that there still remained some of this principle in the precipitate.

As the drug contained a considerable quantity of this substance, which in every particular resembled saponin, a special determination was made by the usual method of estimating that principle. By treating ten grams of the powdered drug with hot water three successive times and straining, a decoction was made. This was precipitated with alcohol, filtered, and the precipitate treated with hot 80 per cent. alcohol, and this added to the filtrate; the alcohol recovered and the residue dissolved in water, concentrated, and precipitated with baryta-water; the precipitate collected, dried at 110°C. and weighed as saponin baryta, the amount being 0·580 gram. This was ignited and weighed as barium carbonate; calculated into the oxide which gave 0·094 gram and this subtracted from 0·580 gram or the amount of saponin-baryta; giving the amount of saponin as 0·486 gram or 4·86 per cent.

From this analysis it is believed that beside the usual plant constituents such as starch, tannin, fat, resin and gum, trillium contains a small quantity of fixed oil, saponin to the extent of 4·86 per cent. and an acid crystalline principle which is colored purplish-brown by sulphuric acid, and light green with sulphuric acid and a crystal of potassium bichromate. It is suggested that this acid principle results from a decomposition of the saponin.

PURSHIA TRIDENTATA, D. C.

By Henry Trimble.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy, No. 100.

Read at the Pharmaceutical Meeting, January 19.

A description of this plant may be found in this Journal, 1891, page 524.

An additional quantity of the seeds has since been received from Dr. Havard, and examined with the following results:

The dry husk-like coverings of the seeds were removed and the latter powdered. Moisture was found to be 11·17 per cent., and ash 2·41 per cent.

Petroleum ether dissolved 6·83 per cent. of an oily substance of a pale amber color and oily taste. It was soluble in hot absolute alcohol, and this solution deposited granular wax on cooling. The cold alcoholic solution contained a saponifiable fat.

Stronger ether removed 1·43 per cent. of a yellow, granular, bitter substance from the seeds. The bitter principle was removed by dissolving as much as possible of this ether extract in water, acidulated with sulphuric acid and agitating this aqueous solution with ether. On evaporation of this latter solvent the bitter principle was left in a crystalline condition in fern-like forms on the bottom and in needles on the sides of the vessel. It is evidently a neutral principle, since it gave no reactions for alkaloids with Mayer's reagent, potassium tri-iodide, gold chloride, picric or tannic acid; an aqueous solution gave a dark green color with ferric chloride, no precipitate with lead acetate and a yellow precipitate with lead oxy-acetate soluble in acetic acid.

That portion of the ether extract insoluble in water was soluble in 95 per cent. alcohol and consisted of resin.

After the action of the two preceding solvents, absolute alcohol extracted 31·14 per cent. The solution was red in color, and upon distilling off the solvent a porous brown residue remained. On treating this residue with water, a solution was obtained which had a reddish color, acid reaction, bitter taste, and a peculiar odor.

This aqueous solution contained 12·03 per cent. of tannin (estimated by gelatin and alum), and 1·08 per cent. of glucose. The tannin was ironbluing. That portion of the alcoholic extract insoluble in water was red in color, soluble in 95 per cent. alcohol, giving a blood-red colored solution, which was precipitated by pouring into water, gave a brown precipitate with alcoholic lead acetate and a purple color with alcoholic ferric chloride.

Water removed from the residual seeds 15·43 per cent. of a faintly bitter substance. 9·72 per cent. were found to be tannin, 1·43 per cent. mucilage, and 1·62 per cent. glucose.

Dilute alkali extracted 16·00 per cent. of pectin and albuminoids and 0·43 per cent. of extractin.

Dilute acid removed 2·21 per cent. consisting of pararabin and the phosphates of calcium and magnesium. The residue yielded 4·55 per cent. of starch, leaving a residue of lignin and cellulin of 8·40 per cent.

The husks of the seeds were found to have a bitter taste, and a quantity exhausted with alcohol, the solvent recovered, the residue dissolved in acidulated water and agitated with ether, yielded on evaporation of the last solvent some of the same bitter principle obtained from the seeds.

ON COMMERCIAL EXTRACT OF VANILLA.

By F. W. Haussmann, Ph.G.

Read at the Pharmaceutical Meeting of the Philadelphia College of Pharmacy, Jan. 19.

The subject of vanillin and commercial vanilla extracts, being dwelled upon at several previous meetings, it may, perhaps, be of interest to consider the same from a commercial standpoint. Very few articles, in as active demand as this extract, show such a variety of composition, as almost every druggist has a different formula. It may be questioned if many pharmacists sell the preparation of the pharmacopœia for flavoring purposes.

At the present day a good quality of vanilla bean cannot be bought under $7 or $8 per pound, and, calculating on this basis, the price of one pint of Tinctura Vanillæ, U. S. P., comes to little less than $1. To sell over the counter and obtain a reasonable profit would compel the pharmacist to demand for this extract at least 10 cents per ounce, which, with the prominence of the "grocery, store" vanilla, is almost impossible. The consumer, as a general rule, is but a poor judge of flavoring extracts, quantity and not quality being the main factors in purchasing. To meet this competition, either the amount of vanilla is decreased or a cheaper tonka or a similar substitution is made. That these substitutions do not replace the agreeable vanilla flavor is a well-known fact.

The National Formulary gives a receipt for a compound tincture of vanillin, a colored, weak alcoholic solution of vanillin with the admixture of a small amount of coumarin. Its cost is rather less than the pharmacopœial tincture. The amount of vanillin in it is however, excessive; less than half the amount given would be sufficient for a preparation intended for counter sale.

The practice is said to be in use to employ a certain amount of the vanilla bean in the preparation of an extract and making a subsequent addition of vanillin. This addition will give the finished preparation an agreeable flavor, and it is possible that the better quality of commercial vanilla extracts are made in this way.

To what extent this takes place is not possible to tell. Incidentally may be mentioned that the sale of this and most other flavoring extracts has passed beyond the limits of pharmacy and into the hands of grocers and provision dealers.

PERCENTAGES IN SOLUTIONS.

By Joseph W. England, Ph.G.

Read at the Pharmaceutical Meeting of the Philadelphia College of Pharmacy, Jan. 19.

Concerning the subject of percentages in solutions, a sharp distinction should always be made between percentage by weight and percentage by volume. They are by no means identical. In the former the proportions are all by weight, in the latter the solids are by weight, and the liquids by volume. Where the term percentage alone is used, it is always understood to be percentage by weight. Where percentage by volume is meant, it is always so expressed.

Now concerning percentage or percentage by weight. The matter of mixing one liquid with another is merely a question of relative proportions. It is in the dissolving of a solid or solids in a liquid, where difficulties arise, especially where it is desired to ascertain the quantity necessary for a fluidounce, or a pint, etc., of a certain per cent. solution.

In the majority of instances the solvent used is water, the weight of each fluidounce being 455·7 grains, and of each pint 7,291 grains. Suppose, for example, that one wishes to make a fluidounce of a 10 per cent. cocaine solution, then we would make 455·7 grains, the weight of a fluidounce of water, 90 per cent., and ascertain the 10 per cent. of cocaine by simple proportion, as follows:

$$90 : 10 :: 455{\cdot}7 : 50{\cdot}6 \text{ grains.}$$

In other words, 50·6 grains of the salt dissolved in one fluidounce of water would give a 10 per cent. solution, slightly excess in volume, to a fluidounce, according to the increase of volume resulting from the dissolved salt. Another method may be followed. Mul-

tiply 455·7 by the percentage desired, to obtain the quantity in grains of the solid, dissolve in a small quantity of the solvent, and then add sufficient water to make the whole *weigh* 455·7 grains. In this case, also, the volume will be slightly less than a fluidounce.

When it is stated that each solid, on solution, displaces a different volume of the solvent according to the solid dissolved, it will be seen that to obtain *exactly* a fluidounce or a pint of a certain per cent. solution of a compound, there must be taken into consideration the relative expansion in volume of each solid; and each solid is a law unto itself. Hence, it is more practical to take the weight of a fluidounce or a pint of the solvent, as 100 per cent. minus the per cent. solution desired, as a basis, and work out the quantity desired by simple proportion, ignoring the increase in volume, which of necessity must be an ever variable factor, according to the compound dissolved. Say, for example, that one wishes to make a $\frac{1}{1000}$ or a $\frac{1}{1500}$ or a $\frac{1}{2000}$ solution of bichloride of mercury, the readiest method is to divide 7,291 by 1,000, 1,500 or 2,000 to obtain the number of grains per pint, and then add sufficient water to make the product weigh 7,291 grains. In this connection it may be of value to state that it is never necessary to use alcohol in making the familiar 1 : 8 bichloride of mercury solution when ammonium chloride is also ordered, as water alone is sufficient to dissolve mercuric chloride under these conditions. In the absence of the ammonium salt, however, alcohol is essential for solution.

Concerning the 1 : 20, 1 : 40, or 1 : 60 carbolic acid solutions, these terms may either be reduced to a percentage first, and the proper quantity of the acid per pint obtained by multiplying 7.291 by the percentage, or 7,291 may be divided by 20, 40 or 60, as the case may be, to obtain the number of grains per pint—in both cases, however, making up to 7,291 grains in weight by the addition of water. If a gallon of the solution be wished, it is scarcely needful to say, that the quantity should be multiplied by eight, and the number of grains, for convenience sake, reduced either to troy ounces by dividing by 480, or to avoirdupois ounces by dividing by 437 5.

When it becomes necessary to use a liquid other than water as the solvent, a seeming difficulty arises, but it is one which is easily overcome. In such a case, first determine the weight in grains of a fluidounce or of a pint of the dissolving liquid by multiplying

455·7, or 7,291, by its specific gravity, and the product will be the weight desired. Say, for example, that the weight of a fluidounce of alcohol is required; the specific gravity of alcohol at the common temperature is 0·820, and 455·7 multiplied by this will give the desired weight. If chloroform is used we multiply by 1·485, or if stronger ether, by 0·725. Where extreme accuracy is required it becomes essential to first ascertain the specific gravity of the solvent at a temperature taken at the time of solution, and then deduce the weight of a fluidounce as above. This, however, is rarely necessary, and for every-day practical purposes is not essential.

THE BUSINESS ASPECTS OF PHARMACY.

By Joseph Harrop, Ph.G.

Read before the Philadelphia College of Pharmacy at the Pharmaceutical Meeting, January 19.

The outlook of the business of the pharmacist is a common topic of discussion in these days, and not without good cause; indeed the subject is a pressing one, and proofs of this fact meet us on every hand. From the distant Pacific slope comes published word of the ill condition of the calling in the cradle of Pharmacy in the Atlantic States, and from every section of our country can be heard spasmodic wails of anguish telling of wrongs endured.

The dilemma is intensified by the diverting from its original and natural channel of the sale of the great illegitimates—the proprietary class of goods, which aforetime did much to add to the general prosperity of the average druggist. This, however, while the most talked-of, is only one of many reasons for the general commotion now taking hold of the former complacent and commonly prosperous apothecary, which prosperous condition has become sadly changed in these latter days; and the end is not yet.

The leading professional journals in the calling are lending their aid in efforts to define the cause and find the cure. The remedy in this particular ailment is as plain and easy as the most simple business problem that could present itself. It will solve itself, and is being solved, by the only natural and possible means, namely, a proprietor of an exclusive and proprietary article has the power to regulate its manufacture and sale, and to enforce his conditions, or

he can withhold its sale in any given location or to any individual. Further, every honest proprietor and manufacturer will see that this right is respected. If this element is not in him, or selfish ends only are perceptible to his defective mental vision, then the non-secret preparations of the individual dealer will compel him to respect those rights. So, sooner or later, the question will be solved.

As before remarked, this is only one of the many causes of the want of prosperity in our business. Specific medication, as introduced by the homœopathic representatives of the healing art, is responsible for many of our apparent ills. (I say apparent, for we have lived long enough to have learned that many supposed ills are only blessings in disguise.) We would refer particularly to one result of that manner of prosecuting the practice of healing peculiar to this class.

Originally there were introduced pleasant potions in various forms, and then came pellets or little pills to suit the taste of the most fastidious. This form has captured the women and children en masse, and the adult males are fast falling into line. *Now come tablets*, and tablets have come to stay. They are only a return by a round-about way to the old confections of a century ago, but in an infinitely more presentable and palatable form. With tablets has come also the discomfiture of the apothecary.

Two causes affecting the business of the druggists of the day have been recounted. The first, as already remarked, will fully and in good time right itself from its extreme abuse. The second will, to my mind, from its medium of application—the physician—open up a wider and deeper cause for complaints from the present-day apothecary. For the compact, pleasant and portable form of tablets will make it possible to readily place in the patient's hands remedies which will replace at once powders and pellets; and now that the day of elixirs is well past its meridian, it will replace also, to a degree, every known form of medication.

The business of the apothecary is, without doubt, undergoing a transformation which, in its ultimate extent, is but poorly comprehended at this time. I fully believe that within another quarter of a century the business of the druggist will be as distinct from that of the true pharmacist, as was that of the herb dealer of a half century ago from the old-time apothecary.

Legislation has scarcely taken its first step forward. Not all the States have even yet a form of law regulating the practice of Pharmacy, and when the next step is taken, and the next, there will be seen, coming to the front, wafted on breezes from the older and better regulated communities of the old world, a protection long needed, and even now formed in the minds of the thinking men of the profession—a protection to legitimate Pharmacy. It is as sure to come as La Grippe or dengue, for ideas spread faster and lay hold of the people more surely than disease. The inevitable is being forced upon us. The light from the rising sun of a better day is already being seen in the Eastern horizon.

Columbus, O.

ABSTRACTS FROM THE FRENCH JOURNALS.

TRANSLATED FOR THE AMERICAN JOURNAL OF PHARMACY.

ACTION OF BORAX ON CHLORAL.—Mr. Dujardin (*Bullet. Commerc.*, April, 1891) found that in preparing solutions containing borax and chloral, considerable depends on the temperature at which the compounds are brought together. At ordinary temperatures no change is observed; on warming, however, decomposition of the chloral takes place, a long-continued, slightly elevated temperature decomposing the chloral as effectually as a few minutes boiling. The decomposition in this case seems to be similar to that which takes place when an alkaline hydrate is used; at least chloroform is one of the decomposition products. In dispensing the two substances it is recommended to dissolve the borax, if necessary, by heat, and allow the solution to cool before adding the chloral.

BISMUTH SALICYLATE.—Duyk (*Bull. Soc. Pharm. Bruxelles*, Oct., 1891) proposes the following method for the preparation of bismuth salicylate: 100 gm. subnitrate of bismuth are treated for one or two days with one litre of water, to which 50 gm. water of ammonia had been added. After shaking sufficiently the subnitrate is completely changed into an oxide, which is collected and carefully washed with water. This oxide, after expression, is heated, under constant stirring, with 25 gm. powdered salicylic acid on a water-bath. When union has been effected, which is found by using litmus paper, the salicylate of bismuth is washed and then dried at a slightly elevated temperature. (See also Amer. Jour. Phar., 1891, p. 401.)

NEW REAGENTS FOR COPPER SALTS.—*Le Moniteur de la Pharmacie* (1891, 1006) states that pyrogallic acid and a cold solution of neutral sulphate of sodium yield with small quantities of copper salts a blood red color. 1 cc. of a solution of copper sulphate, $\frac{1}{3000000}$, still shows the reaction.

Mr. Denigés evaporates the solution to be analyzed, to dryness, and adds to the calcined residue one drop of a 5 per cent. solution of bromide of potassium. The mixture is again evaporated to dryness when, if copper be present, a characteristic violet zone of anhydrous copper bromide appears.

REAGENT FOR TANNIN.—Baemes (*Monit. de la Pharm.*, 1891, 1006) uses as a reagent for tannin a solution containing in 10 cc., 1 gm. sodium tungstate and 2 gm. sodium acetate. This yields with tannin in acid or alkaline solution a straw-colored precipitate which is insoluble in water. The reaction is said to be very sensitive.

REACTION OF SALOL.—According to *Journal de Pharmacie d' Anvers*, the following is a characteristic reaction of salol. A small quantity of salol is added to a few drops of nitrosulphuric acid. The mixture is colored yellow and on stirring with a glass rod it changes to brown and then to green. On diluting with about 50 gm. of water the liquid assumes a rose color, the green color reappearing on adding ammonia. Resorcin treated in the same manner gives a deep blue color; on dilution, red. In the latter solution, ammonia causes the blue color to reappear.

A NEW INTESTINAL ANTISEPTIC.—Yvon and Berlioz (*Jour. Pharm. Chim.*, 1891, 479) use in place of the β-naphtholsalicylate the β-naphtholbenzoate or *benzonaphthol*. This is prepared by heating 250 gm. powdered β-naphthol and 270 gm. pure benzoylchloride on a sand bath slowly to 125° C. and then for half an hour to 170° C. After cooling, the congealed mass is crystallized twice from 8 to 10 times its weight of boiling 90 per cent. alcohol. The β-naphthol can also be separated by heating the mass with dilute sodium hydrate (20 gm. solution of sodium hydrate to 1 litre of water) for 20 minutes to 50 or 60° C. and then washing until the product gives no blue coloration with potassium hydrate and chloroform. Benzonaphthol is almost insoluble in water, more soluble in alcohol and easily in chloroform; its fusing point is at 110° C. The tests for its purity are as follows: (1) A blue color must not appear when a

small piece of potassium hydrate is added to a boiling solution of benzonaphthol in alcohol-free chloroform. (2) An alcoholic solution of benzonaphthol to which an equal volume of nitric acid has been added, must not become cherry red in color on addition of a few drops of acid mercuric nitrate solution.

β-IODONAPHTHOL, A NEW ARISTOL.—G. Braille (*L'Union pharmaceut.*, 1891, 437) gives the following directions for the preparation of this body: A solution of 24 gm. iodine and 27 gm. potassium iodide in water is added to a solution containing 110 gm. β-naphthol and 40 gm. potassium hydrate. To this mixture is gradually added a solution of sodium hypochlorite containing 10 times its volume of combined chlorine. β-iodonaphthol separates in the form of a green-yellow pulverulent precipitate, which is washed several times and then dried. It is odorless and tasteless, insoluble in water, partially soluble in alcohol and acetic acid. On exposure to light the body is quickly darkened.

FERRATED COD-LIVER OIL.—*Bulletin de la Société de Pharmacie*, Bordeaux, 1891, 341, gives the following formula for this preparation. Cod-liver oil 2,000 gm.; alcohol 90 per cent., 1,500 gm. and caustic potash 3,300 gm., are heated until saponification has taken place; then while warm the mass is mixed with perchloride of iron, 2,700 gm., in distilled water, 5,000 gm. The iron soap separates as a brown mass, is washed with water and then heated to drive out the water. Lastly it is dissolved with the aid of heat in five times the quantity of cod-liver oil. The finished product, weighing 2,700 gm., is set aside to settle and is then filtered

QUINETHYLINE has been prepared by E. Grimaux and A. Arnaud (*Compt. rend. 112*, 1364) by heating in sealed tubes at 95–100° C. cupreine dissolved in alcohol, with sodium and ethyl nitrate. The dry base melts at 160° C., is very soluble in all ordinary solvents for alkaloids and yields very fluorescent solutions with excess of sulphuric acid. The normal sulphate crystallizes in colorless efflorescing prisms, dissolves in 51 parts of water at 19° C., and with hydriodic acid and iodine yields garnet-red needles, unlike the plates of herapathite given by quinine. The new base is the ethyl-ether of cupreine, while quinine is the corresponding methyl-ether. (See Amer. Jour. Phar., 1891, p. 350.)

GALLIC ACID, when heated for several hours to 60° C., with zinc powder and ammonia solution, is converted into benzoic acid, according to C. E. Guignet (*Compt. rend., 113*, 200). The same result is produced by heating gallic acid with zinc and dilute sulphuric acid. *Tannin* treated in a similar manner, is first transformed into gallic acid, and yields finally benzoic acid.

KOLA NUT.—Monavon and Perrond have made comparative physiological experiments (*Lyon méd.*, 1891, No. 46), which lead them to the conclusion that caffeine is not the only tissue-economizing principle present, but that other compounds of kola nut likewise diminish tissue-waste. In this direction is the action of kola red, although it has only a slight effect upon the elimination of nitrogen compounds and phosphates. The extract of kola has the same effect as the powder.

VAPORS OF NAPTHALIN are recommended as a remedy in whooping cough, by Chavernac (*Bull. gén. de Thér.*, Oct. 30, 1891). About 15 to 20 gm. of the compound are slowly vaporized from a porcelain dish, taking care that the naphthalin is not ignited, since the smoke is acrid and irritating. The vapors give prompt relief in the disease named, unless complicated with tubercular or emphysematous affections, when they are apt to cause distress.

ANTIPYRIN, in doses of 0·25 gm. every two hours, is recommended by Dr. Guibert of Montpellier (*Sem. méd.*, 1891, No. 34) for checking the secretion of milk; no unpleasant effects have been observed.

GLEANINGS FROM THE GERMAN JOURNALS.

BY FRANK X. MOERK, PH.G.

The iodine-absorption of fixed oils.—In the Am. Journ. of Pharm., 1891, 484, the method proposed by Dr. Holde was published. In the Chemiker Zeitung 1891, p. 1791, Dr. W. Fahrion published an article upon the same subject which offers some very decided improvements over the method of Dr. Holde: These are (1) a simple, although not new method, for the standardization of the thiosulphate solution; (2) the excess of iodine solution is exactly stated; (3) the iodine solution is capable of being used even after standing for several months; and (4) that the determination for both drying and non-drying oils is identical.

The necessary reagents are as follows: Mercuric chloride solu-

tion, 60 grams in one liter 95 per cent. alcohol; iodine solution, 50 grams in one liter 95 per cent. alcohol; thiosulphate of sodium solution, 24 grams of the crystallized salt in one liter distilled water; potassium iodide solution, 10 per cent.; potassium bichromate solution, 3·874 grams pure, dry salt in one liter water; chloroform; dilute hydrochloric acid.

To standardize the thiosulphate solution—10 cc. potassium iodide solution, 5 cc. dilute hydrochloric acid, 20 cc. potassium bichromate solution and 150 cc. water are placed in a stoppered flask of 300 cc. capacity and well agitated; to the red solution which contains exactly 0·2 gm. free iodine, is added the thiosulphate solution from a burette until a faint bluish-green color due to the chromium salt results (the addition of starch is not necessary and besides is considered a source of error, as the albuminoids generally present in starch liberate iodine). One cc. thiosulphate solution corresponds generally to 12–14 mg. iodine; by keeping in well-stoppered bottles very little change in the strength of this solution takes place. *To standardize the iodine solution*—10 cc. each of the iodine and mercuric chloride solutions are placed in the flask, 20 cc. potassium iodide solution and 150 cc. water added; after thorough agitation the thiosulphate is added until the liquid becomes colorless. *The determination of the iodine-absorption* of the oil presupposes that the nature of the oil is known; if unknown, a preliminary determination must be made. 0·2–0·3 gram of the oil to be examined is weighed into the flask, dissolved in 20 cc. chloroform, a quantity of iodine solution added, which contains *four times as much iodine* as is likely to be absorbed, previously mixed with an equal volume of the mercuric chloride solution; in a second flask are placed the same quantities of chloroform, iodine and mercuric chloride solutions; after standing two hours the proper quantity of potassium iodide solution (for each gram iodine about four grams potassium iodide) and 50–100 cc. water are added, and the mixture titrated with the thiosulphate solution; the difference between the two represents the iodine absorbed by the oil. In the examination of olive oil which has an iodine-absorption of about 84 for one gram oil, 3·360 gm. iodine should be added; in the case of linseed oil, one gram requires 7·20 grams iodine to be added because 180 is the iodine-absorption figure.

To keep drugs, which are easily attacked by insects, R. Idelson

sprays them with ether, and places them in a tightly stoppered glass container which has been rinsed with ether, and is then kept in a dark and cool place. This plan has been found very satisfactory in keeping raspberries, juniper-berries, taraxacum and parsley roots, etc.—*Pharm. Ztschr. f. Russl.*, 1891, 757.

Presence of metals in volatile oils. — A crystalline sediment, deposited by oil of cassia, was proven to be lead cinnamate; the oil being exported from China in lead-containers accounts for this. An examination of twelve samples of commercial oil of cassia revealed lead in all but one sample; the test is easily made by agitating a few drops of the oil with hydrogen sulphide water, when the globules of oil become red to black in color, depending upon the amount of lead present.

A sample of *sandal-wood oil* exported in a zinc-container was found to separate a sediment containing zinc. These observations lead to the recommendation that essential oils should be kept in glass vessels only.—E. Hirschsohn, *Pharm. Ztschr. f. Russl.*, 1891, 790.

Tumenol-preparations are recent dermal remedies; they are prepared from the mineral oils obtained in the distillation of bituminous slate; after agitating the oil first with sodium hydrate and then with sulphuric acid it is treated with fuming sulphuric acid; the dark syrupy liquid which separates is washed with water and salt solution, and then dissolved in sodium hydrate solution; from this solution ether extracts what is called *tumenol-oil* (an aromatic, syrupy liquid, soluble in ether, ligroin and benzol); by the addition of hydrochloric acid to the sodium hydrate solution *tumenol-sulphonic acid* is precipitated (a black, bitter, odorless powder soluble in water, but precipitated by addition of acids). A mixture of these two substances forms *tumenol-venale*, a soft, resinous, odorless mass. They have strong reducing actions and their effect is probably due to this; in this they differ notably from ichthyol which owes its action to the sulphur present. Tumenol-preparations are used either as lotions or as ointments containing 5–10 per cent. tumenol along with zinc oxide or bismuth subnitrate.—(*Deutsch. Med. Wochenschr.*) *Apoth. Ztg.*, 1891, 663.

Solutol is a new disinfectant containing in 100 cc., 60·4 grams cresol of which one-fourth is free, the other three-fourths in combination as sodium-cresol; it is claimed to combine the disinfecting action of cresol and sodium hydrate. It is generally used in 5 per cent.

solution. For outside use a crude solutol is offered which, however, owing to impurities of pyridine and hydrocarbons, has a disagreeable odor; for the disinfecting of rooms, etc., an odorless, pure solutol is manufactured. For surgical disinfection a neutral solution of cresol in sodium-cresol is sold under the name of *solveol;* used in one-half per cent. solution it is less poisonous than a phenol solution of equal efficacy (2–3, and in some cases 5 per cent.). It is miscible with any kind of water, forming a perfectly clear solution.—J. Reich, *Oesterr. Ztschr. f. Pharm.*, 1891, 694.

Hæmol and Hæmogallol are two preparations containing iron, which for easy assimilation far surpass any compound previously used; they were first prepared by Prof. Kobert by the action of reducing agents upon the blood-coloring matter; in the first-mentioned zinc-dust is used (a minute quantity of zinc is allowed to remain in this preparation as it exerts a favorable action in certain defects of the stomach and intestines): in the last mentioned, pyrogallol is used; the former is a dark brown, the latter a red brown powder. The dose ranges from 0·1–0·5 gm. three times a day; an agreeable form of administration was found in chocolate tablets, each representing a little over one milligram metallic iron, one to be taken fifteen minutes before meals. Patents have been applied for, for these two preparations.—*Oesterr. Ztschr. f. Pharm.*, 1891, 724.

Guaiacolum carbonicum is the latest of the patented guaiacol preparations; it is made by dissolving two molecules guaiacol in the proper quantity of sodium hydrate solution and then slowly passing carbonyl chloride (one molecule) through the solution; the precipitated carbonate is washed with soda and water and recrystallized from alcohol. It has the formula $CO(OC_6H_4OCH_3)_2$, is soluble in hot alcohol, ether, chloroform and benzol, insoluble in water and nearly so in cold alcohol; it forms an odorless and tasteless crystalline powder, melting at 85° C. It is easily saponified by alkalies and taken internally this change is produced in the intestines, the products formed being guaiacol and carbonic acid.—J. Reich, *Oesterr. Ztschr. f. Pharm.*, 1891, 725.

Aristolochin is the name given by Dr. J. Pohl to the active principle of the seeds of *Aristolochia Clematitis* and the roots of *A. rotunda* and *A. longa*. The powdered drugs were exhausted with petroleum-ether, which removed chlorophyll, oil and a gelatinous, nitro-

genous, inactive substance (occasionally this can be obtained crystalline); warm 96 per cent. alcohol removed the coloring and bitter principles; after evaporating to syrupy consistence it was taken up with water and acidulated with sulphuric acid, the precipitate collected, expressed, dried at 40° C., and extracted in a Soxhlet apparatus for some weeks with petroleum-ether until the last traces of the above-mentioned nitrogenous substance were removed and the residue exhausted with alcohol or ether; from this alcoholic or ethereal solution there separated after a time yellow crystalline masses which, recrystallized several times from ethereal solution, were found to constitute the active principle. It is soluble in chloroform, ether, acetone, phenol, acetic anhydride, aniline and alcohol; almost insoluble in cold water, slightly soluble in warm water; insoluble in petroleum-ether, benzol and carbon disulphide; alkalies and alkaline-earth hydrates dissolve it; from neutral or alkaline solutions it is precipitated by neutral and basic lead acetate, dialyzed iron, zinc sulphate, silver nitrate and a saturated solution of salt, but not by alum, copper sulphate and platinic chloride; it does not reduce Fehling's solution and does not react with Millon's reagent. Its ultimate analysis, C 59·98, H 3·54, N 4·32, O 32·16, leads to the formula $C_{32}H_{22}N_2O_{13}$. Physiologically it was found that cold-blooded animals were entirely indifferent to it; while in warm-blooded animals uræmic intoxication was produced; in this respect aristolochin is a much more powerful agent than any other substance; it resembles aloin in its action upon the kidneys, but is about ten times more poisonous—it is probable that given to man it may act as a cathartic.—(*Arch. f. exper. Pathol. u. Pharm.*) *Apoth. Ztg.*, 1891, 642.

Arsenical cod-liver oil, upon the request of a specialist in children's diseases, was prepared as follows: 0·5 gm. arsenious oxide was warmed with 20 grams absolute alcohol in a small flask; no solution took place until a small particle of potassium carbonate was added when the oxide immediately dissolved without dissolving the potassium carbonate; after filtering, the solution was added to 1,500 grams cod-liver oil and warmed on a water-bath until the alcohol was dissipated. The oil is perfectly transparent and holds the arsenious oxide in solution; 30 grams of the preparation contain 5 mg. arsenious oxide [this is not correct if the arsenious oxide be completely dissolved; 30 grams will then contain 10 mg.—F. X. M.] and can be given to children in doses of ½–1 teaspoonful.—A. Janssen, *Pharm. Ztg.*, 1891, 780.

New tests to detect vegetable oils in lard.—If one gram or 25 drops of a fixed oil be dissolved in 5 cc. chloroform in a test tube, 2 cc. phospho-molybdic acid or sodium phosphomolybdate solution and a few drops of nitric acid added, there will be produced upon agitation an emerald green mixture; upon standing, two layers will separate, the lower chloroform solution being colorless, and the upper layer beautifully green. It is thought that the reaction is due to the vegetable oils containing minute quantities of alkaloids or glucosides which reduce the phosphomolybdic acid. The color is obtained with all these oils if they have not been chemically treated to remove acidity or color; in such cases the color may not be developed or only after some time. If the acid solution be supersaturated with an alkali or alkaline carbonate, the green color changes to a blue, the intensity of which corresponds to the green color. Mineral and animal fats (paraffin, vaselin, lard, etc.) excepting cod-liver oil, will *not* give the green color. To test lard for such adulteration one gram is dissolved in chloroform and then proceeded with as mentioned. Another test for fixed oils which is serviceable in detecting cotton-seed oil in lard, is to add to the lard a cold saturated solution of picric acid in ether and allow the solvent to slowly evaporate; pure lard will then show a lemon-yellow color, whereas, admixed with cotton-seed oil, it will have a brown-red color; pure cotton-seed or other fixed oil will become brown. Phospho-tungstic acid will also suffer reduction through the fixed oils, especially cotton-seed oil and cod-liver oil; in this case there is produced a violet coloration which on addition of excess of alkali (ammonia) changes to a beautiful blue, but the colorations with this reagent are not as permanent as with phosphomolybdic acid.—P. Welmans, *Pharm. Ztg.*, 1891, 798, and 1892, 22.

Salophen, or acetyl-p-amidosalol is a synthetic patented product used in cases of acute articular rheumatism in doses of four to six grams per day. It forms small, thin lamina, odorless and tasteless; almost insoluble in cold water, slightly soluble in boiling water, forming a neutral solution; more soluble in warm alcohol and ether; readily soluble in solutions of alkaline hydrates; it melts at 187–188° C. and contains about 51 per cent. salicylic acid. It is made by a complicated process and has the formula C_6H_4 (OH) COO C_6H_4 $NHCOCH_3$.—Dr. F. Goldmann, *Pharm. Ztg.*, 1891, 773.

MICRO-ORGANISMS IN PHARMACEUTICAL PREPARATIONS.

It is a matter of common knowledge that orange-flower water and other aromatic distilled waters are prone to become flocculent, to change in color and odor, and generally to become thoroughly objectionable. It is also well known that plain distilled water itself —that, for example, used in London for aërated waters—becomes ropy unless it be specially treated. So also certain saline solutions appear to undergo a change which, like these other cases, is supposed to be more or less microbic or vegetative. The phenomena have always had considerable interest to pharmacists and chemical investigators, and several in this country, as well as in France, Germany, and the United States have devoted special attention to it.

Considering that it is as far back as 1832 that Dr. B. Biasoletto, of Trieste, discovered and described the *hygrocrocis* fungus which infests aromatic waters, it would scarcely be excusable to refer to the matter now, were it not that Mr. H. Barnouvin, a distinguished French chemist, has recently published a useful epitome of his own investigations. He has given close attention to the subject for eight years, and is able to state that the micro-organisms which are found in distilled waters (*hydrolats*) are algæ, bacteria and fungi. These are not usually found associated together; in fact, the presence of one or other generally suffices to determine the condition of the water. The fungus commonly found in these media is the *Hygrocrocis hydrolatorum*. That and others more rarely found are characterized by the extraordinary shapes which they assume; they have no reproductive organs, simply conidiæ; at first they are of a pale color, but they gradually become black, thickish, and of great density, giving the waters a viscous appearance. These fungi are only developed if the hydrolates are acid at the moment of distillation. Bacteria are never found in that condition, but as the preparations change to neutrality they become abundantly charged with bacterial life. It sometimes happens that bacteria are present in large numbers in normally acid preparations, and when that is the case we have strong evidence that decomposition has advanced far. It is also noteworthy that bacteria are generally found in inodorous hydrolates, and fungi in the aromatic. The bacteria most commonly found in distilled waters are species of *Leptothrix* and *Micrococcus*. Barnou-

vin has found color-generating organisms in orange-flower and rose waters, but only when the preparations have been exposed to the light.

The presence of algæ is rarer than is generally credited, and when they are observed they are found to be species of *Protococcus*, *Hæmatococcus* and *Chlorococcus*. Light is essential for their production, especially in the case of green algæ; but these are seldom observed, the condition generally corresponding to advanced decomposition, the fluid having masses of shiny and blackish flocks of dead matter floating through it.

M. Barnouvin has extended his researches to the examination of the yellowish deposit which is formed by orange-flower water. This, as far as we can remember, has never been described, attention being solely directed to the filamentous growths in the water itself, which are composed of fungoid remains, spores of fungi, and the living plants. Examination of the yellow deposit with a high-power objective shows it to consist of free and united cells, yellow in color, globular in shape and immovable. They are apparently a true color-producing bacterium, and have, in a general way, the characteristics of *Micrococcus luteus*, Cohn. (*Bacteridium luteum*, Schrœder.)

The existence of micro-organisms in certain saline solutions has been observed, and their nature more or less definitely determined by different observers. Marchand found, ten years ago, a peculiar fungus (*Hygrocrocis arsenicus*) in arsenical solutions, and a few years later Barnouvin published a list of solutions of salts in which similar fungi are found, the list including cocaine hydrochlorate, quinine hydrobromate, pilocarpine nitrate, etc. Purely inorganic substances—*e. g.*, potassium bromide and chlorate, boracic acid, and magnesium citrate, are equally liable to attack. In all these cases it is proved that the distilled water used in making the solutions already contains the germs or the young organisms, and the development corresponds with the nature of salt. The organisms are rarely green, and it has been noticed that the hygrocrocis develops in these solutions much less abundantly than in hydrolates, and that the organisms are frequently sterile. Bacteria only occur sporadically in such media, and algæ are also rarely found; but, strange to say, Barnouvin has found in Boudin's arsenical solution organisms shaped like a turnip, which show the presence of a true diatom of the tribe *Navicules*.

This is a branch of research which few pharmacists can take up, but, fortunately, the results so far obtained are sufficiently specific to permit a general rule to be drawn, which is, that in cases where solutions become infected with micro-organic life, the water used as the solvent is most probably the source of the infection. Not only should distilled water be boiled, but the containers for it should be frequently cleaned out thoroughly. There are many slight but annoying changes in pharmaceutical products which might be obviated by the exercise of more initial care to exclude micro-organisms.—The Chemist and Druggist, Jan. 2, 1892, p. 18.

INFLUENCE OF TEMPERATURE ON DIGESTIVE FERMENTS.[1]

By E. Biernacki.

Digestive ferments require for their efficient action a certain reaction and a suitable temperature. The *optimum* temperature is 39–40°; that is, a little over that of the body. Higher temperatures destroy the ferment, and the present research is occupied with the determination of the temperature necessary for this latter purpose.

The first ferment investigated was trypsin, and it was found that 45° C. markedly lessens its activity, and exposure for five minutes to 50° destroys it altogether. The specimens of trypsin employed were some pure, some impure, and certain exceptions to the above-stated rule were noted. It being very improbable that various trypsins differ in this particular, in virtue of their inherent characters, experiments were instituted to determine the factor that caused the difference. It was found that small admixtures with certain salts had the power of increasing the resistance of the ferment to temperature; the activity of the ferment was often lessened by the salt (although this was more marked in the case of pepsin), but the *optimum* temperature was 50°; 55° lessened, and 60° destroyed, the activity of the ferment. The salts which acted thus were ammonium sulphate (a salt used in the preparation of some specimens of ferment used in the preliminary experiments), ammonium chloride, phosphate and nitrate, and sodium chloride. If mixtures of two or more of these salts were used, the effect was more marked still.

Certain salts (ammonium carbonate and oxalate, magnesium

[1] *Zeit. Biol.*, **28**, 49–71; Jour. Chem. Soc., 1891, p. 1271.

sulphate, sodium sulphate and phosphate), starch and sugar had no such action, but certain products of proteolytic activity (albumose, amphopeptone and antipeptone) act like the salts just enumerated. All the materials that act in this way increase the alkalinity of the digesting medium; minute doses of sodium hydroxide act in a precisely similar way, and the proposition is advanced that the whole of the phenomena are simply dependent on the reaction. Increase of alkalinity protects the ferment. It was found that increase of acidity (trypsin will act in an acid medium if salicylic acid be employed) acts in exactly the opposite way; in an acid medium, 33–35° is the *optimum* temperature; 40° hinders, and 45° destroys, the action of the ferment.

Pepsin was then investigated, and it was found that acidity acts towards this ferment precisely like alkalinity towards the tryptic ferment, the temperature necessary to destroy its activity rising from 65° to 70°. In a neutral medium, the temperature falls to 55°.

Unfiltered fresh saliva loses its diastatic properties at 75°, filtered saliva at 70°, diluted saliva at 60°, pure ptyalin at 70°, unless its solution is much diluted, when the necessary temperature sinks to 60°. The influence of salts, reaction, etc., is exactly the same in kind as with trypsin. In all cases, if the pure ferment be used, the influence of temperature and the influence of salts, etc., on the temperature are more easily observed than if the ferment be impure, as contained, for instance, in the digestive juice.

The explanation of these occurrences probably lies in the formation of loose compounds with the enzymes, analogous to the pepsin-hydrochloric acid of Schmidt and other authors.

COFFEE-LEAF TEA.

Mr. William Sowerby, the veteran and distinguished secretary of the Royal Botanical Gardens, has sent to the *British Medical Journal* a note on his recent pregnant suggestion for adding to the number of alkaloidal beverages by the introduction of *coffee-tea*. When walking in the Gardens of the Royal Botanic Society, Regent's Park, and noting the extent of the collection of living medicinal and economic plants of all climes and countries there brought together in one spot, it must have occurred to all of us how very small a number of plants, out of the vast store which Nature has provided, man has bound to his service, and the yet fewer he

has taken the trouble to cultivate. During the march of the last half-century (in science, medicine, mechanics, steam and electricity) how little has been the gain from Nature's stores. The artificial culture of cinchona is, perhaps, the most noted of the few. Again, any step in eating, drinking, or dress, is so governed by habit or fashion that he must be a bold man who tries to turn the current. This is illustrated in tea drinking. Perhaps there is no one habit so universal; each people has its peculiar tea or closely allied beverage, and most of these have continued the same for many ages. In one it is cacao, in others coffee, and in many tea; in a few special quarters of the globe nothing but matê is thought fit to drink, but in only one small district is coffee-leaf tea used. Now we all know that these beverages are found by man to be pleasant and agreeable to him by reason of their containing a peculiar principle called theine; but yet we do not always select for our use the part of the plant containing the largest percentage of theine, or cultivate the special plant with a view to afford us the most valuable part. For example, in coffee the leaves are said to contain 1·26 of theine and the berries only 1·0 per cent., and yet over 110,000,000 of men use the berries and only 2,000,000 the leaves of coffee, although 500,000,000 use the leaves of tea. Now the cultivation of coffee berries is very trying, precarious, subject to attacks of blight and unfruitfulness—in fact it follows the general line that the produce of fruit by cultivation is far more open to accident than that of leaves, and very probably good crops of coffee leaves could be obtained at small cost in countries and localities where it would be risky or even impossible to produce berries. Here is a case open to a vast variety of peoples to solve, for there can be no reason why coffee leaves may not become a valuable item of culture in our warmer colonies and many parts of the world. The one most difficult item to move is to create the demand. Once start the fashion for "5 o'clock coffee-leaf tea," and the thing is done and many a fortune made. As to the peculiar flavor of coffee-leaf tea, much depends on the manipulation of the leaf after it is taken from the plant. At the Botanic Gardens a variety of flavors have by treatment been produced from leaves off of one plant, the general flavor being a kind of combination of coffee and tea so as to get both in one cup. This is much the same flavor as kola nut.—Quart. Therap. Review, January, 1892.

FALSE PELLITORY ROOT.

By E. M. Holmes, F.L.S.,
Curator of the Museum of the Pharmaceutical Society of Great Britain.

A few weeks since, a small sample of pellitory root (*Anacyclus Pyrethrum*) was forwarded to me by a wholesale herbalist in London, stating that it had been offered to the wholesale trade, but that there was some doubt as to its genuineness. The only feature noticeable at the first glance was the slightly paler color of some of

Fig. 1.—*Anacyclus Pyrethrum.*

Fig. 2.—*Corrigiola telephiifolia.*

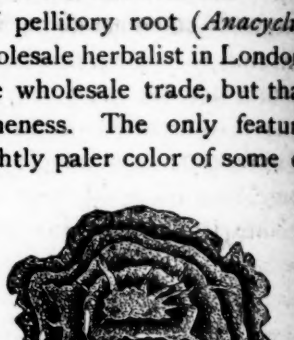

Fig. 3.—Transverse section of the *Corrigiola telephiifolia*, magnified.

Fig. 4.—Transverse section of *Anacyclus Pyrethrum*, magnified.

the pieces, but on cutting a transverse section and examining it under a lens, it was noticed that some of the specimens possessed a structure entirely different from that of pellitory, and that it was quite possible to distinguish the spurious root by this means. Some of the pieces, however, so closely resembled pellitory root in general appearance (*Figs. 1* and *2*) that they might easily be overlooked. It seemed desirable, therefore, to place on record the occurrence of the spurious root, and to point out the features by which it may be recognized.

The apex of the spurious root is generally crowned with small wart-like protuberances, such as frequently occur in senega root and in many of the *Caryophyllaceæ*: these are evidently the remains of the bases of slightly woody, slender stems. The transverse section of the root is of a yellowish-white color, with three to five pale opaque concentric rings (*Fig. 3*), each one alternating with a darker and narrower translucent horny ring.[1]

The taste is sweetish at first, leaving after a time a slight tingling sensation, which recalls that of senega. The root possesses scarcely any odor. It is softer and more flexible than pellitory root.

In the root of *Anacyclus Pyrethrum* the structure is quite different.

The apex of the root is generally crowned with a tuft of short white hairs. The transverse section exhibits a single ring of radiating linear vascular bundles, which appears porous and of a yellowish color, the medullary rays and inner portion of the bark being of a creamy white tint, becoming much darker or of a pale brown hue in badly dried pieces. Scattered over the surface, but much more abundantly towards the circumference of the section, may be seen yellowish-brown oil receptacles, containing the odorous and resinous matters of the root (*Fig. 4*).

The identification of the root proved to be a matter of some difficulty, although its appearance seemed familiar to me. A section placed under the microscope showed no starch, nor did tincture of iodine manifest the presence of it.

Thinking, from its resemblance to dandelion root, that it might possibly belong to the *Compositæ*, it was examined for inulin, but without result, nor were laticiferous vessels observed in it, nor raphides.

I then sent a portion of it to Professor Radlkofer, of Munich, whose knowledge of the anatomy of the stems of plants is probably unequalled, asking him if he knew any plants of the natural order *Phytolaccaceæ* at all resembling it, for the roots bear a greater likeness to some species of *Phytolacca* than any other plant known to me. He was unable to identify it, but suggested a comparison with other known roots coming from the same district, if possible. Pel-

[1] In this character it recalls the appearance of dandelion root, but in that root the rings are interrupted, narrower and more spongy, and there is a well-marked woody centre of a yellow color and porous character.

litory root being a native of northern Africa, it occurred to me that I had seen a root very like the spurious root in a collection of Morocco drugs presented some years ago by Dr. A. Leared (*Pharm. Journ.* [3], vol. v, p. 521). On examination of the roots in that collection it was found that the spurious pellitory was identical in appearance, structure and taste with the root called "towsergent" or "tauzarghente," which had been already identified by me as that of *Corrigiola telephiifolia*, Pour., belonging to the natural order *Illecebraceæ*. The fact that this little plant is glabrous, whilst *Anacyclus Pyrethrum* is hairy, explains the presence of the radical tuft of hairs on the apex of the one root and its absence from the other. Very little is known of the structure of the plants of the natural order *Illecebraceæ* or *Paronychiaceæ*, and that little refers chiefly to stems and not to root structure.

A brief account of the *stem* structure of *Corrigiola* is given in *Ann. des Sciences Nat.* ([4], tom. xiv, p. 117), but as pellitory root is rarely if ever used in a powdered state, and in an entire state the root of *Corrigiola telephiifolia* is easily identified, it is unnecessary to enter into histological details in the present note.—Phar. Jour. and Trans., Nov. 21, 1891, p. 405.

THE BARK OF GONOLOBUS CONDURANGO.[1]

By G. Carrara.

The bark is extracted with strong alcohol, and the filtered solution allowed to cool; a greenish powder (A) falls, leaving a yellowish-brown solution (B). On treating A with ether, it is divided into a soluble part (*a*), and a yellowish, insoluble powder (*b*); the latter is purified by dissolving it in boiling alcohol, allowing the solution to cool, and washing the deposit repeatedly with alcohol and ether. It proves to be a glucoside of the composition $C_{40}H_{74}O_6$, which melts at 112°, and is insoluble in ether and light petroleum, sparingly soluble in cold alcohol, and very slightly in water; the aqueous solution is not precipitated by potassium mercuric iodide, or by a solution of iodine and potassium iodide. When boiled for some hours with dilute sulphuric acid, the liquid reduces Fehling's solution.

The glucoside, when heated with benzoic chloride at 100°, forms a benzoyl derivative, $C_{40}H_{73}O_6Bz$; this can be purified by precipitation from its solution in chloroform by alcohol. It is a brownish-

[1] *Gazetta*, **21**, 204–212; Jour. Chem. Soc., 1891, 1387.

red powder, insoluble in alcohol, water, and light petroleum, very soluble in chloroform, but only sparingly in ether; it blackens at 250°, and melts with decomposition above 270°. On evaporating the mixture of alcohol and chloroform from which this compound is deposited, a white powder is left, which melts at 72°, and yields benzoic acid when boiled with potash solution; a sufficient quantity for complete examination could not be obtained.

The substance *a* is boiled with alcoholic potash, the alcohol evaporated, the residue taken up with water, and extracted with ether; on evaporation, a yellow powder is obtained, showing the color reactions of chloresterol, but melting at 52° and having the composition $C_{30}H_{50}O_2$; this compound the author names *conduransterin*.

The aqueous solution remaining after extraction of the conduransterin by ether contains cinnamic acid.

The original extract B has not yet been fully examined.

REPORT ON COMMERCIAL GOA POWDERS.

By W. Duncan and T. S. Tweedie.

Goa or Araroba powder, or poh'di bahia, or as it was called by Kemp, "chrysarobine," made its appearance in British pharmacy about sixteen years ago, and at that time Professor Attfield read a paper on its composition at an evening meeting of the Pharmaceutical Society in Edinburgh. The sample of the drug on which he worked was presented to him by Mr. D. Kemp, of Bombay. In that paper Professor Attfield (*Pharmaceutical Journal* [3], vol. v; *Am. Jour. Pharm.*, 1875, 330) states that he obtained from 80 to 84 per cent. of an active principle which he identified as chrysophanic acid. In a subsequent research by Liebermann and Seidler (*Ibid.* [3], vol. ix; *Amer. Jour. Phar.*, 1879, p. 80) it was shown that the active principle consisted essentially of a substance which by oxidation readily yielded chrysophanic acid, and to this they gave the name "chrysarobin." This title, of which we heard so much in 1885, when the present Pharmacopœia came out, is now by common consent confined to the purified article or so-called "chrysophanic acid" of commerce. The doubts on this point have been cleared up by the insertion in later reprints of the Pharmacopœia of the words, "as purified by solvents." This purified article has almost entirely taken the place of the crude drug, but from our own experience we have reason to

doubt if the purified article possesses the same activity as an equivalent quantity of the crude drug. This opinion is supported by the statement of Martindale ('Extra Pharmacopœia,' 6th edition, p. 108) that there remains in the mother liquor from which chrysarobin has crystallized, a substance more active than pure chrysarobin.

As already pointed out, Attfield found that Goa powder yielded from 80 to 84 per cent. of chrysarobin. Liebermann and Seidler put it at 66 per cent. and the United States Pharmacopœia at 54 per cent. For the last four or five years statements have appeared to the effect that the drug of the present time was much weaker than formerly, and contained less chrysarobin. This has been attributed to the Brazilians hewing down the tree (*Andira Araroba*) before it has reached maturity. It was while testing the value of this statement that the experiments, of which we now give the results, were undertaken.

Chrysarobin is readily extracted by hot benzol, but the difficulties of using that solvent in a Soxhlet apparatus, decided us to use chloroform, checking our results by ether. In the 'Extra Pharmacopœia' (p. 109) chrysarobin is said to be insoluble in ether. This, we find, is erroneous. It is soluble in ether, but we cannot agree with the U. S. Dispensatory (16th edition, p. 433) that it is readily soluble.

Ten commercial samples of Goa powder were examined. These

Sample.	Chrysarobin per cent.	Moisture per cent.	Insoluble matter p. c.
1,	76·90	2·10	21·00
2,	55·50	3·00	41·50
3,	80 80	2·60	16·60
4,	66·60	2·40	31·00
5,	81·80	2·20	16 00
6,	82·30	2·20	15·50
7,	57·20	3·30	39·50
8,	70·80	1·20	28·00
9,	68·85	2·90	28·25
10,	69·10	2·90	28·00
Average,	71·00	2·50	26·50

were obtained from different sources, in order that we might not have two of the same sample to examine. Four of these were in

an unpowdered condition and mixed with pieces of wood. The others were in powder of various degrees of fineness. All were reduced to the same powdered condition, interfering in no other way by removing the wood or otherwise. As a rule those samples which were in broken lumps and appeared most inferior, yielded the best results. We have brought the samples with us, and it will be seen that they vary very much in color.

The insoluble matter was not examined, but it appeared to consist mainly of woody tissue, and left a little ash on burning. From the above results it is evident that the statements as to the deficiency of commercial Goa powder at the present time are not well founded, but that the present supply compares favorably with the drug originally imported.—Phar. Jour. and Trans., January 2, 1892, p. 543.

ESTIMATION OF SUGAR AND TANNIN IN WINES.[1]

By J. H. Vogel.

The author has proved by several experiments that it is absolutely necessary to first remove the tannin and coloring matters before attempting to estimate the sugars by Fehling's solution. 25 cc. of a 1 per cent. solution of tannin gave an amount of metallic copper corresponding with 0·91 per cent. of sugar. As the amount of tannin in Portuguese wines often is as high as 3 per cent., the importance of fully removing the tannin will be readily understood. After a short treatment with an insufficient amount of animal charcoal, the tannin is removed before the coloring matters are precipitated, and this fact enabled the author to prove that these coloring matters exercise a powerful reduction on Fehling's solution, as the yield of copper became greater as the solution was more colored. Their removal is best effected either with animal charcoal or basic lead acetate, but the author has made several important observations. As to the use of lead solution, 3 cc. is supposed to be sufficient for 60 cc. of Rhine wine, whilst for red wines the amount must be doubled. But in the case of Portuguese wines, this amount is far too small, and the author has met with a sample which required three times its bulk of *liquor plumbi* before it was completely decolorized. The excess of lead must be removed, according to Barth, by sodium carbonate, but the lead separates slowly, causing after-

[1] *Zeit. ang. Chem.*, 1891, 44–69; Jour. Chem. Soc., 1891, p. 1557.

wards an increase in the weight of the copper precipitate, and unless the filtration has been very carefully effected, the sugar may come out from 0·2 to 2·2 per cent. too high, the error increasing with the amount of lead solution used. For wines rich in tannin and coloring matters, the charcoal process is the best. If, for this purpose, powdered purified animal charcoal is used, 25 grams of the charcoal will be found sufficient for 200 cc. of wine. The time the charcoal is allowed to act varies from 15 to 60 minutes, according to the amount of coloring matters present. A little sugar is also absorbed by the charcoal, but the author, who has thoroughly investigated the matter, finds the amount never to exceed 0·3 per cent. under the most unfavorable conditions. In some cases, it is advisable to first dilute the sample with a known volume of water before attempting to decolorize with the charcoal. The author next investigated the two chief processes used for the estimation of the tannin. It must be borne in mind that this acid, as it occurs in wines, is not at all a definite chemical compound, and is not identical with gallo-tannic acid. The percentage found by analysis is therefore not the true one, but only expresses its equivalent in gallo-tannic acid. The process which was found to answer best was that of Löwenthal. According to this method, the solution containing the tannin is largely diluted with water, mixed with a definite quantity of solution of indigo-carmine, containing sulphuric acid, and then titrated with a weak solution of potassium permanganate. Operating on a known quantity of tannin, and deducting the permanganate necessary for the oxidation of the indigo alone, the exact strength of the permanganate expressed in tannin is, of course, obtained.

In applying the process to wine, which, of course, contains many other organic matters, also oxidizable by permanganate, the author proceeds as follows: 20 cc. of the sample is mixed with 2 litres of rainwater, 20 cc. of solution of indigo-carmine (30 grams per litre), and 10 cc. of sulphuric acid. A solution of potassium permanganate (1 : 1000) which has been carefully standardized is now run in until the liquid just loses its green, and changes to a bright yellow color. To obtain the amount of permanganate absorbed by the organic matter, 50 cc. of the sample is mixed with 100 cc. of a solution of gelatin (1 : 1000), and 60 cc. (= 20 cc. of original sample) is filtered off, and again titrated. The difference between the two titrations represents the true amount of tannin. The permanganate absorbed

by the excess of the gelatin varies but slightly, but may be put down as 0·2 cc. As regards the process depending on the precipitation of the tannin by an ammoniacal solution of zinc acetate, previous to titration, the author found it to give results far too high and generally untrustworthy, even with solutions of pure tannic acid.

ON BORIC ACID AND A NEW BORIC PREPARATION.[1]

By Dr. Jaenicke.

Experiments were made to determine (1) the power of boric acid to kill bacteria, and (2) its capacity for preventing their development in animal fluids. The author tried the influence of a saturated (four per cent.) solution of boric acid on pure cultures of the *Staphylococcus aureus*, and also on anthrax bacilli. These organisms were placed in the boric acid solution, and then at regular intervals cultivations in sterilized broth were tried, and in some cases animals were injected. The staphylococcus could be cultivated after eight days' immersion in the boric solution, and in one case indeed after fourteen, and only after three weeks were they absolutely killed. The susceptible bacilli of splenic fever were, after twenty-four hours, still living, and capable of infecting a mouse. They died only after three days. These experiments prove that the disinfecting property of boric acid is so slight that for practical purposes it is of no value, and that boric acid is useless for the disinfection of hands, instruments, etc, or for applying to fresh operation wounds.

On the other hand, the power of boric acid to prevent the development and increase of micro-organisms, and the consequent production of toxines and toxalbumins, etc., is very considerable. The author added sterilized boric acid, in gradually increasing proportions, to blood-serum and broth, in a series of culture glasses, and then inoculated them with pure bacterial cultures, keeping them at 37°, and comparing the effects of this proceeding with what occurred in a control glass free from boric acid. The development of bacteria first took place in this glass, then it occurred in that containing the smallest amount of boric acid, and more slowly in those containing a larger amount, until at last no change took place. This occurred in blood-serum and broth containing *Staphylococcus aureus*, when 4 to 5 per cent. of boric acid was present; in the case

[1] *Therap. Monatsh.;* Abstract from Med. Chronicle, November, 1891.

of *Streptococcus pyogenes* when 6 per cent. was present; for stopping anthrax bacilli 9 per cent. was required; typhus bacilli did not develop under the influence of 7 per cent. Cholera spirilli were the most sensitive, for 3 per cent. arrested their development. Mould fungi ceased to grow in the presence of 4 per cent. But much smaller quantities of boric acid delayed the development for many days, and in some cases—especially the bacilli of anthrax—indications of degeneration were observed in the bacilli themselves. In order to ascertain how much boric acid one must add to the cultivation medium, in order to prevent development of all bacteria, the author mixed several materials known to favor the growth of micro-organisms—earth, sewer water, putrified blood, etc., and inoculated with this mixture a series of cultivation glasses containing serum and broth and also boric acid in gradually increased proportions, keeping the glasses in an ordinary incubator. The glasses with the least proportion of boric acid (1 per cent.) quickly became clouded, owing to the development of numerous micro-organisms of various kinds; more slowly the next glass, which contained 2 per cent. of boric acid, began to show some appearances, but not for three weeks, and then the clouding was only slight; the other glasses which contained 2¼ to 3 per cent. of boric acid remained without any bacterial growth, only a few fungi were developed in them. It may be assumed that in blood-serum and broth the growth of all bacteria is prevented by the addition of 2½ per cent. of boric acid.

In using boric acid therapeutically, whether in substance or in solution, it should be present in excess so as to render the wound unfit for the settlement and growth of micro-organisms. The modes of application must vary with the varied conditions, which are described by the author.

Boric acid is devoid of irritating properties; it does not interfere with the properties of the tissues; it is comparatively devoid of poisonous properties, 70 grams per day having been given internally. It takes $\frac{1}{1500}$ to $\frac{1}{1200}$ of body weight to kill mice. It is four or five times less poisonous than carbolic acid and resorcin and salicylic acid. Borax is not affected by the soft tissues with which it comes in contact.

After its use the author never saw inflammation or formation of pus take place; suppuration quickly disappears, the tendency to the formation of granulations in wounds is rather kept back than encour-

aged. Since boric acid, at ordinary temperature, is only soluble in water, to the extent of 4 per cent, a boric substance was sought for possessing greater solubility and yet retaining its other properties. This combination of properties was found in a mixture of equal parts of boric acid and borax. The body so formed does not differ from boric acid in its antiseptic and pharmacological properties; it is neutral in reaction and forms hard crystals, soluble in water, in ordinary temperatures, to the amount of 16 per cent. At the ordinary temperature of the body a 30 per cent. solution can be made. At boiling temperature 70 per cent. is dissolved, and this does not separate quickly on cooling. The combination of boric acid and borax has been employed with great advantage in purulent affections of the middle ear. It is prepared by heating equal parts of borax, boric acid and water to boiling point; on cooling, crystalline masses separate. As the substance is only slowly dissolved at ordinary temperatures, the author advises that a solution, in the first place, be made with water at a boiling temperature.

[NOTE.—The proportions given by Dr. Jaenicke correspond to rather more than six molecules of boric acid, $B(OH)_3$, for one of borax, and the resulting product consists chiefly of Atterberg's (1875) salt, $B_4O_5(OH)_2.3B_2O_3 + 10H_2O$. In prescriptions it has been designated *boroboric acid*.—Editor Amer. Jour. Phar.]

THE ESTIMATION OF IODOFORM.

By H. DROOP RICHMOND.

When iodoform is heated with alcoholic soda it is split up with the formation of sodium iodide, sodium formate and other substances; the proportions appear to be that $16CHI_3$ require $42NaOH$, and give 35 NaI and $4KHCO_2$; the estimations made were as follows: for 100 parts iodoform:

	Found.	Calculated from above proportions.
Soda, ...	26·4	26·6
Iodine as iodide, ...	69·3 to 70·4	70·2
Formic acid, ...	3·34	2·92

These figures show that the reaction is a complex one, and I have not attempted to construct an equation to express the changes which take place; with the assumption that for every 100 parts of iodoform, 70 parts of iodine are produced as iodide, a fairly reliable method of working is possible; about ·1 — ·15 gram of iodoform

or such quantity of the substance to be examined as will give that quantity, is weighed out and dissolved in alcohol, an excess of alcoholic soda is added, and after about ten minutes' digestion near the boiling point of the alcohol, the excess of alcohol is evaporated; the residue is taken up with water, made slightly acid with *dilute* nitric acid and a small quantity of calcium carbonate added to restore neutrality. The solution is then titrated with the solution of nitrate of silver used for water analysis (of which 1 cc. = ·005418 gram iodoform); an excess of about ·3 cc. is required to produce a good end reaction with chromate of potash, and this should be subtracted.

SOLUBILITY OF IODINE IN CHLOROFORM.

By W. Duncan.

Some time ago I had occasion to prepare a solution of iodine in chloroform. The difficulty I had in getting the required amount into solution brought to my recollection a remark of one of my students, to the effect that he had found it impossible to make a solution stronger than about 1 grain of iodine in each drachm of chloroform.

On referring to standard works I found that, with one exception, those which refer to the point state that iodine is freely soluble in chloroform. The exception is Squire's "Companion," in which the solubility is given as 1 in 25. I have utterly failed to obtain a solution of this strength, and, for my own satisfaction, have lately made some experiments to clear up the point.

Commercial iodine was taken, mixed with a fourth of its weight of potassium iodide, and carefully sublimed. The sublimate was cooled, powdered and placed in a desiccator to remove any trace of moisture. This chemically pure iodine was then macerated in chloroform for four days, the temperature remaining nearly constant at 10° C., and the mixture being frequently shaken.

Iodine being very volatile, the only methods of estimation possible were either gravimetric, as argentic iodide, or volumetric. The latter method was chosen on account of the comparative ease and rapidity of the process, and if care be taken to have the thiosulphate of sodium solution correct, it is quite as accurate as a gravimetric estimation. The result of a large number of estimations carefully made is to show that at 10° C., chloroform dissolves only

1·77 per cent. of its weight of iodine, or, to put it differently, the solubility of iodine in chloroform is 1 in 56·6. I may say that my results with a solution in which the two have been in contact for two months, are practically the same as the foregoing.

While working at the subject I found it was absolutely necessary, to get good results, that after weighing, the chloroform solution should be diluted with a little alcohol before adding the water, as otherwise the iodine would be thrown out. I found it also necessary to use starch as an indicator, as the solution became apparently colorless before all the free iodine had been taken up.—Phar. Jour. and Trans., January 2, 1892, p. 544.

NOTE ON VOLUMETRIC SOLUTION OF IODINE.

By J. H. Hoseason.

Read before the Edinburgh Assistant Association; reprinted from *Phar. Jour. and Trans.*, January 16, 1892, p. 583.

Though the point dealt with in this paper might seem a small one, it was desirable that the Pharmacopœia should be as completely accurate in every detail as it could reasonably be. He had prepared a standard solution of iodine with which he had examined a sample of arsenious oxide, and found it to be pure. Some time after, the same iodine solution was used with the same sample of arsenious oxide, and it indicated only 97 per cent. As_2O_3. It was concluded that the iodine solution had deteriorated, but the question came to be how could its strength be ascertained without using arsenious oxide as a factor. Titration with standard soda solution was tried, but the end reaction, even with starch paste, was not sufficiently distinct. Nitrate of silver solution was also found to be inapplicable, as a portion of the iodide in the iodine solution combined with the silver at the same time. Certain points noticed seemed to indicate that iodine and iodide of potassium combined in a fixed ratio, but time did not permit of following out this inquiry.

A third method, which proved more satisfactory, was to add a known measure of standard potassium bichromate solution to a solution of potassium iodide in water with a sufficiency of dilute sulphuric acid. Iodine is then set free in the proportion of three molecules to one of potassium bichromate. Subsequent titration of this iodine with sodium hyposulphite solution determines the

strength of the latter, and from this hyposulphite of sodium solution a weak or unknown solution of iodine might be at once corrected or standardized.

Arsenious oxide might also be used, and it has the advantage of being permanent and nonhygroscopic.

The defect in the Pharmacopœia to which Mr. Hoseason directed attention was this: The standard iodine used to fix the value of the hyposulphite of sodium solution, is the one which answers the "characters and tests" of the Pharmacopœia. This official "iodine" is tested by using solution of sodium hyposulphite. It is evident, therefore, that the true value of the iodine can never be ascertained in this way, which is simply a case of reasoning in a circle. He suggested that the following should be the directions for preparing the volumetric solution of iodine: "Mix intimately in a mortar, in the proportion of one of potassium iodide to four of iodine; place in a suitable arrangement and sublime. When cool place the sublimate in a desiccator for two hours. Of this chemically pure iodine, weigh off quickly on a paraffined paper the quantity required, or an unknown quantity may be weighed from weighing tubes and made up to the proper volume with water, so that each 100 cc. contain 1·27 grain of pure iodine." He had examined some commercial and resublimed samples of iodine with the following result:

No	Quality.	Description.	Iodine per cent.	Moisture per cent.
1	Resublimed.	Fine lustrous scales thin, dry.	100	0·0
2	Resublimed.	Small crystalline fragments and dry dust.	99·5	0·5
3	Commercial.	Fine scales and dust.	99·4	0·6 slight fixed residue.
4	Resublimed.	Very small crystals; lustrous, dry.	100	0·0
5	Resublimed.	Very large thick scales and crystalline masses, very moist.	96·6	3·4
6	Resublimed.	Very large thick crystalline scales, moist.	99·2	0·8
7	Commercial.	Dry powdery mass.	97 6	2·4 slight fixed residue.

None of the samples contained chlorine or bromine in quantity. Sample 2 contained a trace of chlorine, and the two commercial samples contained a trace of non-volatile matter, but were otherwise of unexpectedly good quality.

ON THE ACTION OF ANTIFEBRIN, AND PHENACETIN DERIVATIVES.[1]

By H. Aronsen.

This paper, whilst it adds but little to our practical therapeutical knowledge, is one of those contributions to pharmacology by the accumulation of which a firm basis for therapeutics will in time be founded. It is of interest, too, as illustrating the methods by which the physiological influence of those groups of atoms, of which organic compounds consist, is being determined.

It has been shown by Ehrlich that certain kinds of coloring materials taken into the body will distinctly color the brain tissue; but that the introduction into the coloring compounds of a sulpho-group prevents this. Thus, for example, *sodium alizarin* colors the brain yellow, whilst the introduction of a sulphonic acid group into this compound entirely prevents this action.

Aronsen brings forward experiments to show that in like manner the influence which certain antipyretics have in lowering temperature in fever through their influence on the nervous centres, is entirely stopped if an acid group be introduced into their composition.

Liebreich has shown that *acetyl-amido-salicylic acid*, which contains two antithermic groups, antifebrin and salicylic acid, is not itself an antipyretic, and the ethyl compound of this body is likewise not a temperature reducer. In both these bodies the carboxyl group COOH is associated with the benzol component. But it is possible to introduce this group into the second or amido component. Only one body (*acetanilid-acetic acid*) in which such introduction has occurred has yet been examined, and it has been found by Penzolt not to be useful as an antipyretic.

Aronsen points out that this influence may perhaps be due to the breaking up of the group C^6H^5NHCO, to which the compound seems to owe its antipyretic activity, for the introduction of a CH_3

[1] *Deut. med. Woch.*, Nov. 19, 1891; the Med. Chronicle, Jan., 1892.

into the amido component has the same effect in depressing the antipyretic influence. He has, therefore, experimented on a substance—*para-ethoxytartranilic acid*—in which the carboxyl group is neither combined with the benzol nor with the amido component. This substance is a white, tasteless powder, not as toxic as phenacetin, though in sufficient doses it causes changes in the blood. Unlike phenacetin, however, it does not depress temperature in fever. *Succinanilic acid*, which is of analogous composition, gave the same result.

These experiments all go to show that in whatever way the carboxyl group COOH is introduced into an antifebrine or phenacetin molecule it destroys its antipyretic quality.

Aronsen finds, too, indications that the presence of other acid elements, apart from the salt-forming acid group, suffice to prevent the antipyretic activity in the same manner as the carboxyl group does.

Acetylpara-amidoacetophenon has the same composition as phenacetin, except that the group OC^2H^5 is replaced by the acetyl group $CO\,CH^3$, but the antipyretic action of phenacetin is quite wanting in the first-named compound. If it were possible to introduce an acid element into acetanilid or phenacetin, without destroying their antipyretic properties, a soluble antipyretic could be obtained. But Aronsen's observations go to show that this is impossible, and a soluble antipyretic can only be obtained from acetanilid or phenacetin by putting into these compounds a basic group. Such a substance is *phenocoll*, the antipyretic and antirheumatic properties of which have been recently proved by Hertel.

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, January 19, 1892.

The meeting was called to order, and Wm. B. Webb, Ph.M., was requested to preside.

The minutes of the last meeting were read and approved.

The following donations to the library were made: By Mr. Hans M. Wilder, eleven volumes of Wiggers' Jahresbericht, vols. xxvi to xxxvi, inclusive, Flückiger's Pharmacognosie des Pflanzenreiches, and Dr. G. Heppe's Chemische Reactionen; by the author, Prof. Trimble, vol. i, of his monograph, entitled The Tannins; also received from the associations, Proceedings of the American Pharmaceutical Association for 1891, and Year-book of Pharmacy of the British Pharmaceutical Conference for 1891. A vote of thanks was moved and carried to the donors.

A paper upon *Trillium erectum* was read by Mr. Vivian I. Reid of the present senior class.

Professor Trimble read a paper on the *seeds of Purshia tridentata*, the material having been sent by Dr. Havard, U. S. Army.

A paper on the *business aspects of pharmacy*, by Joseph Harrop, was read by Joseph W. England.

Mr. William B. Thompson read a paper suggested by an article in one of the medical journals, under the title of Remarks on Pharmacists.

A paper upon *percentages in solutions* was read by Joseph W. England, Ph.G.

Prof. Maisch said that the only exact method of making solutions of a definite percentage was by basing the calculation upon the proportion of weight of the article to be dissolved to the total weight of solution obtained; if a definite volume of such a solution be wanted, it should be measured afterwards. In the discussion, attention was drawn to percentages by volume, and it was stated that in many cases, on mixing liquids, condensation of volume was observed, and that wherever chemical action takes place change of volume was sure to follow.

Mr. England made some remarks on *pyoktanin* of the several kinds in the market, and said that the conclusions of those who had used it were not as favorable as the reports first made about it.

F. W. Haussmann, Ph.G., read a paper upon *fluid extract of vanilla*; he said that inquiry of three or four druggists revealed the fact that they used two and a half ounces of the bean to make a gallon, as it was not possible to compete with the grocery store vanilla extracts in price if the full quantity of bean were used. Some of the members present stated that they had always made flavoring extract of vanilla of the strength of one ounce to the pint. Attention was also drawn to the pharmacopœial tincture, which is of 10 per cent. strength. Prof. Maisch said that about 25 years ago he saw a short and rather thiek vanilla, much lower in price than Mexican or Bourbon vanilla; but that the drug brokers would not sell him even a sample for his cabinet, as they were under contract to furnish all to certain manufacturers of flavoring extracts. Mr. Thompson said that apothecaries had or could have sufficient influence to get laws passed preventing the sale of articles inferior in quality or made in imitation of good preparations sold by the apothecary. The term adulteration is one that is difficult to define; the mixing of one substance with another of less value or strength is generally considered an adulteration, but certain commodities have to be colored to some extent to satisfy popular demand.

This discussion led to some remarks on *Alexandria senna* as illustrating changes in the character of articles of commerce. Prof. Maisch said that thirty and more years ago the Alexandria senna of commerce consisted of the leaflets of *Cassia acutifolia* mixed with the leaves of *Cynanchum Arghel* in varying proportions; the latter were, in later years, sometimes entirely absent. The political complications in the Soudan caused a scarcity of supply of *C. acutifolia*, and for some time these leaflets were mixed to some extent with those of *C. obovata*, and the latter were even offered as senna. These had been used, in 1876, as packing material for Egyptian goods sent to the Centennial Exhibition; they were regarded in Egypt as of little medicinal value. Recently he had been able to procure from wholesale druggists as Alexandria senna an article consisting of small leaflets of *C. elongata* mixed with a very small pro-

portion of *C. acutifolia* and *C. obovata;* arghel leaves were absent, also *C. pubescens* had not been observed. A very handsome and clean specimen of *C. acutifolia*, almost free from impurities, had been procured from Dr. C. A. Heinitsh.

In reply to a query as to whether *C. marilandica* could not be used, Prof. Maisch stated that this was generally considered as being only about one-half as active; that the true sennas came from shrubs of the subgenus Senna, and that our indigenous plant belonged to another group, Chamæsenna, the botanical distinctions of which were pointed out.

Mr. Thompson referred to the case of a milk dealer, who a short time ago was convicted of adulteration for selling skimmed milk as milk, the court having decided that the removal of an essential constituent from an article of food constituted adulteration. This led to the recital of some cases, showing the importance of a supply of unadulterated milk in large cities. It was stated that the law of Pennsylvania, like that of Massachusetts, required cow's milk to contain not less than 12½ per cent. of solids.

On motion, the papers read were referred to the Publication Committee, and the meeting adjourned. T. S. WIEGAND, *Registrar.*

EDITORIAL.

The seventh International Pharmaceutical Congress.—On page 470 of our preceding volume we published the translation of a circular-letter from the Italian Committee on Organization in which it is stated that the Italian pharmacists are not prepared for the present to convene the seventh congress. On p. 755 of the Proceedings of the American Pharmaceutical Association we find a letter printed, showing that the Executive Committee of the sixth Pharmaceutical Congress has expressed itself favorably regarding the acceptance of the invitation extended by the American Pharmaceutical Association for holding the next Congress in Chicago in 1893; and that the Italian Committee has been advised to cede to the American Pharmaceutical Association the powers received from the Congress of 1885.

The Columbian World's Congress of Pharmacists is the title of one of those gatherings of specialists which it has been proposed to convene in Chicago during the year 1893, under the auspices of "The World's Congress Auxiliary of the World's Columbian Exposition." A committee appointed by the "Auxiliary," consisting of Prof. Oldberg, chairman, and Messrs. E. H. Sargent, Alb. E. Ebert, D. R. Dyche and L. C. Hogan, has just issued a preliminary address, inviting all practitioners of pharmacy, pharmaceutical teachers, authors and journalists, members of pharmaceutical societies and examining boards, and of pharmacopœial committees, manufacturing pharmacists and chemists, and others connected with pharmacy. A special request to send representatives is made to pharmaceutical societies, schools and examining boards, pharmacopœial committees, and other organized pharmaceutical bodies. The objects of this Congress are stated to be the delivery of addresses upon topics of general pharmaceutical interest, the reading of papers upon pharmaceutical questions of a general scope, discussion upon such questions, and mutual acquaintance and intercourse. The meetings are to be so arranged as to take

place between the several medical and allied scientific congresses, so that pharmacists who may be specialists in chemistry, botany, microscopy, etc., may participate in two or more of the congresses held. The Memorial Art Palace, which is to be erected on the shore of Lake Michigan, will contain two large audience rooms and a number of smaller halls for the accommodation of the congresses and of other meetings. The month of May or June, 1893, is suggested for holding the Congress.

The American Pharmaceutical Association, intending to co-operate in the work, appointed a Committee, consisting of the five members appointed by the "Auxiliary," and of Prof. Hallberg and the President and Permanent Secretary *ex-officio*. In addition thereto an Advisory Council is to be formed of both foreign and American Pharmacists, and all interested and intending to participate in the contemplated congress are invited by the Committee to communicate to its chairman any suggestion relating to the plan mapped out by the committee.

The Pennsylvania Pharmacy Board held the October examination in the Central High School at Philadelphia, and in the City Council Chamber at Pittsburg. The January examination was held in Philadelphia, Monday the 18th.

Applicants for Registered Pharmacist's Certificate, 105, passed 39 in October; 106, passed 28 in January.

Applicants for Qualified Assistant's Certificate, 109, passed 72 in October; 115, passed 57 in January.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Proceedings of the American Pharmaceutical Association, at the thirty-ninth annual meeting, held at New Orleans, La., April, 1891; also the Constitution, By-laws and Roll of Members. Philadelphia: Published by the American Pharmaceutical Association. 8vo. Pp. xxiv, 767 and 138 (General Index).

The "Minutes" of the above meeting were sent out to the members in August last, and early in January the bound volume of the "Proceedings" was distributed to those entitled, containing, besides the Minutes, the valuable report on the progress of pharmacy, and the usual matter issued annually with the "Proceedings;" also a general index for the volumes 31 to 38 (1883 to 1890), inclusive. It is learned from an abstract of the Minutes of the Council, that the date for the next annual meeting has been fixed for July, the first session to be held on the morning of Thursday, July 14, and the last session probably on Tuesday evening, July 19. Among the interesting information contained in the volume is the correspondence in relation to the contemplated seventh International Pharmaceutical Congress, which was to assemble in Milan, Italy, and the proposed International Pharmaceutical Congress, in Chicago, in 1893. The General Index was prepared for eight volumes with the view of having hereafter a decennial index published at the close of each decade, as it was intended to do since 1859.

Year-book of Pharmacy, comprising abstracts of papers relating to Pharmacy, Materia Medica and Chemistry, contributed to British and foreign journals from July 1, 1890, to June 30, 1891; with the Transactions of the British Pharma-

ceutical Conference at the twenty-eighth annual meeting held at Cardiff, August, 1891. London: J. & A. Churchill. 8vo. Pp. 544.

The Year-book gives upon 295 pages abstracts from the various journals, and concludes with 18 additional pages containing pretty complete lists of books relating to pharmacy and the collateral sciences. The remaining portion of the volume contains the list of members and the minutes of the last meeting, together with the papers read and the discussions relating thereto. The indispensable index closes the volume.

The Tannins. A monograph on the history, preparation, properties, methods of estimation and uses of the vegetable astringents, with an index to the literature of the subject. By Henry Trimble, Ph.M., Professor of Analytical Chemistry in the Philadelphia College of Pharmacy. Vol. I. Philadelphia: J. B. Lippincott Company. 1892. Pp. 168. Price, $2.

This very interesting monograph makes its appearance at a very appropriate time, namely, at the close of the first century of the recognition of tannin as a distinct principle, which is generally ascribed to the French apothecary Deyeux, in 1793. Without entering into the old views concerning the nature of astringent vegetable substances, the author opens the history of this class of substances, with an account of the results arrived at by Deyeux, and of those of various observers immediately preceding him; and closes the same with Proust's announcement in 1802 that there are many different kinds of tannin in different plants. This historical introduction is followed by chapters on the general characters and on the detection and estimation of tannins; and in Part II by a monograph on gallotannic acid, giving its sources, history, preparation, properties and constitution. A very useful and interesting selection from the very extensive literature on the tannins, commencing with 1791, is given in the lists of authors, of titles and of books, with which the present volume closes. It is to be hoped that the second volume of the work may make its appearance at no distant day.

Age of the Domestic Animals: being a complete treatise on the dentition of the horse, ox, sheep, hog and dog, and on the various other means of determining the age of these animals. By Rush Shippen Huidekoper, M.D., Veterinarian (Alfort, France), Professor of Sanitary Medicine and Veterinary Jurisprudence, American Veterinary College, New York. Illustrated with 200 engravings. Philadelphia and London: F. A. Davis, Publisher, 1891. 8vo. Pp. viii and 217. Price, cloth, $1.75.

In the introductory chapter the author defines the three periods of age in animals, namely, the juvenile or period of growth; the adult or stationary period; and senility or old age, the period of deterioration or of decline. The changes which take place during these periods, depend not only upon inherent or internal causes, but are more or less influenced by external conditions. The age of a domestic animal becomes apparent from its general aspect, from the changes in the conformation of the body, and from the functional activity of its organs, all of which have to be examined in detail, but primarily the condition of the teeth gives the desired information, while changes in other organs must be considered to be of secondary importance for the purpose indicated. For these reasons great prominence is given in the book before us both in descriptions and illustrations to the teeth, their development and changes in

character with advancing age, however, without neglecting other characteristics. From a perusal of the book it is readily seen that the author has fully accomplished his aim, as stated in the preface, according to which he "has attempted to prepare such a book as he feels would have been of interest and service to himself in his association with animals as a layman, and would have aided his studies and appreciation of the anatomy of the teeth, dentition, and means of determining the age. He hopes, also, that this work will furnish, to students and veterinarians, knowledge which will aid in surgical operations on the mouth."

An Examination as to the Reliability of certain Tests for determining the purity of olive oil. By Professor S. Cannizzaro, vice-president of the Senate, Italy, and Dr. G. Fabris, analytical chemist of the Italian customs. 8vo. Pp. 41.

Messrs. Jas. A. Hayes & Co., Boston, have published, in English, this important and interesting report, which proves the great difficulty of establishing the purity of a sample of olive oil from color reactions or the behavior towards certain chemical agents. "An absolutely correct judgment," the authors say, "as to whether an olive oil be pure or not, can be arrived at only from the aggregate results of all the recognized tests and processes already mentioned, and even of any other which the circumstances of each individual case may call for."

Proceedings of the Minnesota State Pharmaceutical Association, at the seventh annual meeting, held at St. Paul, Sept. 9 and 10, 1891. St. Paul. Pp. 96.

Much of the discussion at this meeting related to the various plans for the prevention of cutting in prices. An important measure for the State of Minnesota is the appropriation by the Legislature of $5,000, for the establishment of a school of pharmacy in connection with the State University; this department will be located in the new medical building, and will be opened for instruction in October next. The next meeting will be held in Duluth at a time to be announced hereafter. F. W. Kugler is local secretary.

Proceedings of the Iowa State Pharmaceutical Association, held at Spirit Lake, July 21 and 22, 1891. Twelfth annual meeting. Marshalltown. Pp. 101.

A brief account of the meeting will be found on p. 467 of our last volume. The next meeting will be held in Davenport, June 14. J. W. Ballard is the local secretary.

Proceedings of the New Hampshire Pharmaceutical Association at the eighteenth annual meeting. Manchester, N. H. 1891. Pp. 56.

The meeting was held at Exeter and at Rye Beach, September 8 and 9. President Currier in his annual address alluded to the forthcoming meeting of the American Pharmaceutical Association in the White Mountains, N. H., and expressed the wish for every member to be there in attendance, and that the A. P. A. would gain many new members from the State. The president and executive committee were empowered to make such arrangements as they may deem advisable, in behalf of the Association, towards the reception of the American Pharmaceutical Association. The executive officers for the ensuing year are E. H. Currier, Manchester, president; F. L. Way, Manchester, sec-

retary; and A. D. Smith, Manchester, treasurer; W. P. Underhill, Concord; F. L. Way and G. C. Shedd, Keene, constitute the executive committee. The next annual meeting will be held at Keene, September 6, next.

Minutes of the Twelfth Annual Meeting of the North Carolina Pharmaceutical Association. New Berne, N. C. 1891. Pp. 80.

A brief account of the meeting will be found in our September (1891) number, page 468. Among the papers read is one in which Mr. W. H. Wearn endeavors to prove the presence of tannin in gentian root; his compound is obviously the one which was noticed by Prof. Patch in 1881. The investigations by Van Itallie, made in 1886 with dry gentian and with the fresh roots of three species of gentiana, were evidently unknown to the author. Next meeting in Raleigh, August 10. W. H. King, local secretary.

Proceedings of the National Wholesale Druggists' Association, in convention at Louisville, Ky., Galt House, October 19–23, 1891. Geo. B. Bower, official stenographer. Minneapolis. Pp. 243.

The volume, which is adorned by the likeness of the president, Wm. A. Robinson, and is issued by the secretary, A. B. Merriam, Minneapolis, contains a full account of the discussions at the meetings, and of the speeches at the banquet. Much time was devoted to the consideration of plans for preventing the cutting of retail prices of proprietary articles.

Grasses of the Southwest. Plates and descriptions of the grasses of the desert region of Western Texas, New Mexico, Arizona and Southern California. Part II. By Dr. Geo. Vasey, Botanist, Department of Agriculture. Washington: Government Printing Office. 1891.

This valuable contribution to North American botany contains plates and descriptions of 50 species of grasses, making a total of 100 species, including those of Part I. Most of these plants are but little known, and a goodly number are new species. It is intended to publish a second volume containing the grasses of the Pacific Coast.

Catalogue of the phænogamous and vascular cryptogamous plants in the vicinity of St. Louis, Mo. By Henry Eggert, St. Louis. Mo. Pp. 16. Price, 20 cents.

This catalogue, which is arranged alphabetically, contains the names of nearly 1,100 species which grow in a radius of about 40 miles of St. Louis.

Experiments and Researches on Trap Syphonage, showing the comparative merits of the principal appliances used for trap-seal protection. By Jas. M. Denton, M.E., professor of experimental mechanics in Stevens Institute of Technology, Hoboken. Concord, N. H. 1891. Pp. 56.

Reprint from vol. xvi of the Transactions of the American Public Health Association.

Annual Report of the Postmaster-General of the United States for the fiscal year ending June 30, 1891. Washington. Pp. 183.

A public document containing much interesting statistical information, and embellished with maps and plates, the latter made after photographs of parts of different post-office buildings.

OBITUARY.

Thomas Hyde Hills, a prominent pharmacist of London, England, died in that city November 19, 1891, in the seventy-seventh year of his age. After having learned the apothecary business at Brighton, he secured a situation in the store of John Bell, in London, and after the death of the latter, continued the business as the partner of Jacob Bell who died in 1859. Mr. Hills was the first Associate, 1841 to 1847, of the Pharmaceutical Society of Great Britain, was elected a member in 1848, and subsequently served for many years as vice-president, treasurer and president. He was also a member of the British Pharmaceutical Conference, and held the office of vice-president for several years.

F. Passmore died in London, December 22 last, after a few days of illness. For nearly twenty-two years the deceased had occupied the position of sub-editor of the Pharmaceutical Journal and Transactions.

Professor Jean Servais Stas died in Brussels, Belgium, December 13 last. He was born at Louvain, September 20, 1813, and studied medicine, but soon turned his attention to physics and chemistry, working in the laboratory of J. B. Dumas in Paris. He was afterwards appointed professor of chemistry at the Military Academy of Brussels, and chemist to the mint, and in 1841 was elected a member of the Academy of Sciences in the same city. His researches into the atomic weight of carbon, published in connection with Dumas in 1841, were afterwards extended by him to most other elements, and led to greatly increased perfection in the methods for the determination of such values. The criminal case Bocarmé in 1850 attracted universal attention in scientific circles, when, after patient investigations Stas proved nicotine to have been employed for poisoning. Of the numerous memoirs published by the deceased savant, the following are of especial interest to pharmacists: On phloridzin (1838); chlorinated compounds (1841); acetal (1846); nicotine (1850); berberine (1859); fatty acids (1865), and particularly his celebrated method for the isolation and detection of alkaloids (1852), upon which most of the processes more recently recommended are based. The deceased was attached to many scientific bodies as an honorary or active member; he was an honorary member of the Philadelphia College of Pharmacy.

Emmet Kannal, Ph.G., class 1871, died at Rensselaer, Ind., July 31, 1891. aged 42 years. He learned the drug business in Rensselaer and after graduation, continued in the pharmaceutical business in the same town until 1887; from that time until his death he was in the jeweler's business, and was also much interested in farming and stock-raising. He died of hemorrhage of the bowels, after an illness of two days, leaving a widow and three children.

Leonidas H. Street, Ph.G., class 1875, died in Camden, N. J., Decbr. 10, 1891, of typhoid pneumonia. For some years after he graduated he was in charge of the drug store of Dr. E. Tomlinson, at Gloucester, N. J., and subsequently entered into business in Camden.

Harry B. Taylor, Ph.G., class 1869, died in Philadelphia, Decbr. 17, from exhaustion, the result of blood poisoning. He was the son of the late Dr. Wm. T. Taylor, in whose drug store he was brought up. After his father's death he continued the business for some years, and studied medicine, grad-

uating from the University of Pennsylvania in 1886. He then became one of Coroner Ashbridge's official physicians, and as such, in September, 1890, made post-mortem examinations of several bodies at the Morgue, when one of the assisting students who was sewing up a body, accidentally punctured Dr. Taylor's left wrist with the needle which he was using. Recognizing the gravity of the occasion, he at once had the slight wound cauterized. For a time it gave him no trouble, but afterward abscesses formed on both arms, and although the best medical aid was called in and he took several trips for the benefit of his health, he obtained no relief. Other abscesses formed in his throat and lungs, and he finally died from exhaustion. At the time of his death Dr. Taylor was 41 years of age; he was not married, but was the main support of seven younger sisters who lived with him.

VARIETIES.

Creasote in tuberculosis.—After nine years of experience with small doses of creasote (half a grain daily), Dr. Julius Sommerbrodt, in 1887, expressed himself as inclined to the belief that in the first stages of tuberculosis of the lung, creasote can cure. After using larger doses (1 to 2 grains daily) lasting cures were recorded in long continued and severe cases, and after continuing his observations he reports (*Berl. klin. Wochenschr.*, October 19, 1891) that creasote, in large doses (1 to 4 grains per day), is, for countless cases, unsurpassed as a curative agent in tuberculosis of the lung. For a patient over 10 years his minimal dose is one grain daily, and his maximum dose four grains daily. He has never found bad results from his largest doses. The excipient is of importance. He prefers to give it with cod-liver oil in gelatin capsules, containing one grain of creasote. It keeps best and is best absorbed and best taken in this form. His patients have no other medicine. It usually takes two or three months before its influence is very noticeable. Great numbers of his patients have taken five, ten, twenty thousand capsules *continuously* without a bad symptom, and with excellent appetites, and this in itself is an answer to the objection that it injures the stomach.

Piperazine, $C_4H_{10}N_2$, has the constitution of piperidine, $C_5H_{11}N$, in which CH_2 has been replaced by NH; it has been experimentally used by a number of physicians in cases of gout and of gravel and urinary calculus, due to uric acid concretions. Dr. Heubach (*Centralb. f. Physiol.*, Decb., 1891) has given it subcutaneously in doses of 0·5 gm. four times daily, the injections being painful, but without causing abscesses or unpleasant after-effects. Taken internally in doses of 2·5 gm. it caused severe headache on the following morning, and in one case vomiting. Doses of 1 gm. were taken regularly for several days without causing any derangement. The quantity of urine is not increased; it remains acid, and shows no increase of N (urea) or of P_2O_5; but passed from the fourth to the tenth hour after taking the remedy, becomes dark colored on the addition of HCl, the coloring matter being separable by means of amylic alcohol.